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Inland Transport Instruments: Convention on the Contract for the International Carriage of Goods by Road (CMR)- Additional Protocol to the CMR concerning the Electronic Consignment Note (e-CMR)

Paper on the operationalization of the Additional Protocol to the CMR concerning the Electronic Consignment Note (e-CMR)

Submitted by Germany, Latvia, Slovenia, the International Road Transport Union (IRU), and the Union of Chambers and Commodity Exchanges of Turkey (TOBB)

At the request of the Inland Transport Committee, this paper was drafted by an informal group of experts of SC.1 chaired by Slovenia and with the assistance of the secretariat. It is comprised of five sections: (1) Background and introduction (2) Benefits and costs of implementing e-CMR (3) e-CMR pilot projects (4) Lessons learned and (5) Conclusions.

I. Background and introduction

1. At its eighty-first session in February 2019, the Inland Transport Committee (ITC) foresaw an increased interest in the international conventions with a digital theme administered by its working parties, including the Additional Protocol to the CMR concerning the electronic Consignment Note (e-CMR). Noting the number of accessions and ratifications to Convention on the Contract for the International Carriage of Goods by Road (CMR) and e-CMR, it encouraged the Working Party for Road Transport (SC.1) to increase its efforts to advocate and raise awareness of the benefits of being a contracting party to CMR, Protocol to CMR, and e-CMR.

2. ITC also expressed its support for SC.1 being the main platform for multilateral dialogue and the exchange of best/emerging practices by contracting parties implementing e-CMR, and requested SC.1, with the support of the secretariat, to prepare a paper detailing the research and other actions needed and/or recommended for the operationalization of e-CMR, to be tabled at a future ITC session.

3. With the requested paper in mind, the secretariat invited interested volunteers from SC.1 to form an informal group to draft this document. Accordingly, an informal group of experts comprising of Slovenia, Latvia, Turkey, Russian Federation and Germany, the European Commission and IRU, was formed in October 2019 with Slovenia as chair. The informal group met virtually several times between May 2020 and July 2021. This paper was drafted based on the contributions from group members.

4. Over the past ten years, the world has changed rapidly with digitalization emerging as a key theme in light of the great advances in technology. In 2020, the development of digital systems which facilitate online transactions was given another significant boost by the Covid 19 pandemic. Digital solutions such as e-CMR which allow the exchange of electronic information without physical contact and which facilitate the flow of goods across borders are also seen as a good answer to address Covid 19 challenges and to build back better. The potential benefits and costs of replacing paper consignment notes with electronic ones are covered in Section 2 of this paper.

5. As countries transition to increasingly digital economies, attention has turned towards international conventions which facilitate digital transactions, documents, and systems. For example, as at the date of this paper, the number of contracting states to e-CMR was nearly 2.5 times more than what it was three years ago. That is, from 12 contracting states in October 2017 to 29 contracting states in December 2020. Further states are working towards acceding to e-CMR in the near future.

6. A state acceding to e-CMR enables the parties to a contract of carriage relating to its territory to make use of the opportunities digital technology offers, in particular to use electronic consignment notes. This is especially important as, with an increasing number of contracting states as well as non-contracting states involved in pilot projects, and transport corridors of contracting states geographically situated next to each other emerging in the past three years, more and more carriers are able and willing to make use of the benefits of electronic consignment notes. Thus, the authors of this paper anticipate that the demand for replacing paper-based consignment notes with electronic consignment notes will increase substantially in the short to medium term future especially in contracting states which are also EU members.

7. This paper is comprised of five sections: (1) Background and introduction (2) Benefits and costs of implementing e-CMR (3) e-CMR pilot projects (4) Lessons learned and (5) Conclusions. The informal group's efforts and input focused on the identification of benefits and costs when e-CMR will be operational and on lessons learned and practices followed while performing several pilot tests.

II. Benefits and costs of implementing e-CMR

A. Benefits

8. The motivation to move from a traditional system of paper-based to electronic consignment notes stems from the potential economic, social, and environmental benefits that are associated with digitalization in general. The unexpected event of the Covid 19 pandemic in 2020 highlighted the social (namely sanitary) benefits of a digital document. That is, the need for less physical contact between persons and a reduced handling of physical items including paper documents.

9. Specifically, in relation to the digitalization of consignment notes, recent pilot projects have confirmed the economic benefits (see section 3 for more details). The following are the key areas of benefits identified by the experts of the informal group or by other resources indicated by the experts of the group.

1. Time savings and reductions in administrative costs

10. The use of electronic consignment notes would result in significant time and cost savings for the parties involved in the carriage of goods by road. Through digitalisation, senders and carriers do not need to create paper copies of the CMR document. Neither would they need to scan or send it by mail or archive it physically.[1] Invoicing and payment processes are expedited since parties can start them at the exact moment of delivery. [2]

[1] Olga A. Dmitrieva, Elena N. Rudakova, Dmitry E. Morkovkin, Alexey V. Gubin, Alla V. Pavlova and Anton E. Polyakov, "Recommendations About Improvement of Application of Customs Procedure of Customs Transit in the Russian Federation When Transporting Goods by the Motor Transport," 5th International Conference on Economics, Management, Law and Education (EMLE) 2019, Advances in Economics, Business and Management Research Vol. 110, 2019: 10.

[2] "State of play and barriers to the use of electronic transport documents for freight transport: Options for EU level policy interventions – Final report," European Commission, 2018: 48; "Joint statement

11. According to various assessments, 3 time savings from the digitalisation of documents for the carriage of goods by road are estimated to range between 5 to 20 minutes per consignment, and administrative/operational cost savings are estimated to be between € 2 to € 13 per consignment. According to IRU, the potential volume of e-CMR documents for Europe alone is of 145 to 210 million per year for international transport, which multiplied by the cost savings per note quantifies potential savings of between € 290 million and € 2.73 billion annually.

2. Facilitation of transport processes

12. Digitalisation of paper consignment notes would facilitate transport flows by making the process/scenarios simpler and swifter. For example, carriers might not need to stop at borders to show authorities a paper consignment note as electronic documents have the potential of being readily accessed by all parties involved who have access to the system(s) if integrity of data and therefore trust to those system(s) by the different stakeholders is ensured . Electronic consignment notes are also more easily preserved. Furthermore, IT service providers, centralised or decentralized, can develop systems that allow the translation of all coded information in order to ensure the maximum transparency. Furthermore, and in order to allow the transmission and display of all languages, the characters set by the system(s) could be Unicode.

3. Access to information in real time

13. Digitalization allows parties to track the physical location of the goods being transported in real time if appropriate mechanisms (i.e. telematics) have been installed on the trucks and / or if tracking systems have been developed along the transport supply chains. Accordingly, detours or unexpected events would be reflected and come to the attention of monitoring parties quickly, and with the possibility for parties to include detailed descriptions and photographs, depending on the ability and desire of the carriers to do so. Importantly, having access to real time information such as the goods in road vehicles and the details of the trips, will enable authorities to monitor the carriage of goods by road more efficiently and target inspections towards cases they consider more appropriate.

4. Enhanced health and safety

14. The use of electronic consignment notes would reduce the need for physical interaction between some parties in the transport supply chain by eliminating the need for paper to pass from sender to carrier, carrier to authority, and carrier to consignee. In addition, depending on the acceptance of electronic documents between neighbouring countries or other countries within the relevant transport corridor, queues at border crossing points or checkpoints could be avoided or reduced through having separate lanes for vehicles using electronic transport documents, thereby decreasing the risk of transmission at these locations. Of course, this could be achieved if all transport, customs, business and phytosanitary documents have been digitalized with the most, if possible, harmonized and integrated way.

on e-CMR", ECG-IRU, 26 January 2021: 1, https://www.iru.org/sites/default/files/2017-01/2017%2001%2026%20e-CMR%20Brochure%20web-ECGIRU.pdf

[3] These include IRU estimates referenced in "State of play and barriers to the use of electronic transport documents for freight transport: Options for EU level policy interventions – Final report," *European Commission*, 2018: 47, http://publications.europa.eu/resource/cellar/8e10f21a-0346-11e9-adde-01aa75ed71a1.0001.01/DOC_1; a SIRA Consulting (2012) study cited in "Commission Staff Working Document – Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on electronic freight transport information," *European Commission*, 17 May 2018: 87, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52018SC0052%2801%29; and a University of Hasselt (2019) study referenced in by Arjan Velthoven, "e-CMR scheelt 13 euro per document aan administratieve kosten," TTM.nl, 13 November 2019, https://www.ttm.nl/it/e-cmr-scheelt-13-euro-per-document-aan-administratieve-kosten/121202/

5. Reduction in paper consumption

15. Shifting from paper to electronic consignment notes would save thousands of trees based on the millions of paper consignment notes currently used per year for the international carriage of goods by road across different countries and regions.[4]

6. Trade and innovation spillovers

16. e-CMR provides contracting states with a comparative advantage in relation to trade flows compared to countries that have not ratified or acceded to it. Finally, the development of IT systems for the implementation of e-CMR can foster innovation spillovers across the economy and generate data to better inform cross-border transport policies.[5]

B. Costs[6]

17. Moving from paper-based to electronic consignment notes might require some initial investments by some or all the interested stakeholders depending on which business and technical approaches will be followed towards the operationalization of e-CMR. The training of drivers and other relevant personnel involved in using the system(s) should also be factored.

1. Design, implementation, and maintenance costs for businesses/industry

18. Industry or the businesses providing carriage of goods by road that wish to make use of legally valid electronic communication in the performance of a CMR contract of carriage must adapt their operations and might need to invest in telephony / IT solutions to implement e-CMR. According to estimations reported by the European Commission in 2018[7], a firm operating around 200 trucks and employing 360 employees is likely to spend between € 70,000 and € 75,000 in the transition to electronic documents, assuming they provide smartphones for every truck. Again, everything depends on the final system(s) that will be commonly agreed / approved by all stakeholders that will support the operations of e-CMR. For a business operating around 200 trucks and employing 360 employees, if they issued 200,000 CMRs annually, the expected net benefit of e-CMR would be € 150,000 per year.

2. Possibly: Design, implementation, and maintenance costs for authorities

19. e-CMR as such is directed at carriers and their clients, providing them with a "legal infrastructure" for legally valid electronic communication in the performance of a CMR contract of carriage. Hence it does not directly entail implementation costs for authorities. As the paper CMR consignment note proves the basic elements of a carriage of goods (e. g. parties involved, type of goods, place of taking over and of delivery) it has been widely used also for administrative purposes in which those details are relevant. Where a state acceding to e-CMR plans to allow businesses to use e-CMR consignment notes for such administrative purposes or even requires them to do so there may be costs arising for the development of appropriate IT systems.

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[4] "Digital Transformation: ECMR – A digital future for the CMR document," https://vrioeurope.com/en/digital-transformation-ecmr-a-digital-future-for-the-cmr-document/ as cited in Miloš Poliak and Jana Tomicová, "Transport Document in Road Freight Transport – Paper versus electronic Consignment Note CMR," The Archives of Automotive Engineering – Archiwum Motoryzacji Vol. 90, No. 4, 2020: 53.

[5] Momchil Antov, "Possibilities for Application of E-CMR from a Customs Point of View," p. 132.

[6] Information in this section, unless otherwise stated, comes from "Commission Staff Working Document – Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on electronic freight transport information," European Commission, 17 May 2018.

[7] "Commission Staff Working Document – Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on electronic freight transport information," European Commission, 17 May 2018: 74.

20. Requirements set by governments as regards the use of e-CMR consignment notes for administrative purposes, if any, should, as far as possible, take account of the business and technological approach followed and agreed upon among the different stakeholders concerning the operations of e-CMR. Anticipated e-CMR implementation costs for authorities could be for example those related to the accreditation and control processes of IT service providers, controlling activities for transport and/or customs authorities, and technology infrastructure. If a centralized system(s) is used, it could even be that there might not be any recurrent costs. In terms of time, for instance, a Belgian e-CMR pilot estimated that approximately 1,050 hours were necessary for establishing the system of certification of IT service providers carried out by the relevant authority, and between 20 and 40 hours per week were necessary to conduct recurrent tasks.

C. Other considerations[8]

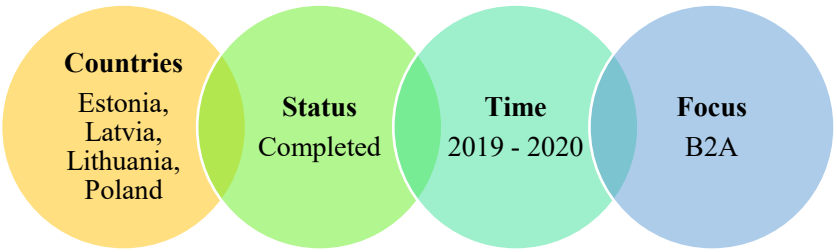
21. According to an impact assessment by the European Commission, the implementation of electronic documents, including e-CMR, would have mixed effects on employment. It is expected that digitalization would allow businesses to reassign employees to higher-value activities.

III. e-CMR pilot projects

22. Various countries (contracting states as well as non-contracting states) and private sector entities have carried out e-CMR pilots at national, binational, and multinational scales. The focus of each pilot has been different, with some exploring the information exchange between business to business actors (“B2B”), while others have focused primarily on the information exchange between business to administration or business to government actors (“B2A”) and administration to administration or government to government actors (“A2A”).

A. Multinational e-CMR Pilot Projects

1. DIGINNO-Proto Project – Estonia, Latvia, Lithuania, and Poland[9]



[8] Information from this section, unless otherwise stated, comes from “Commission Staff Working Document – Impact Assessment Accompanying the document Proposal for a Regulation of the European Parliament and of the Council on electronic freight transport information,” European Commission, 17 May 2018: 51.

[9] Information and images from this section, unless specified otherwise, come from “Final Report – eCMR index registry prototype,” Ministry of Economic Affairs and Communications of the Republic of Estonia, and Nordic Council of Ministers, September 2020, https://koodivaramu.eesti.ee/majandus-ja-kommunikatsiooniministeerium/ecmr-prototype-testing/-/blob/master/documents/Final_Report_of_eCRM_Index_Registry.pdf

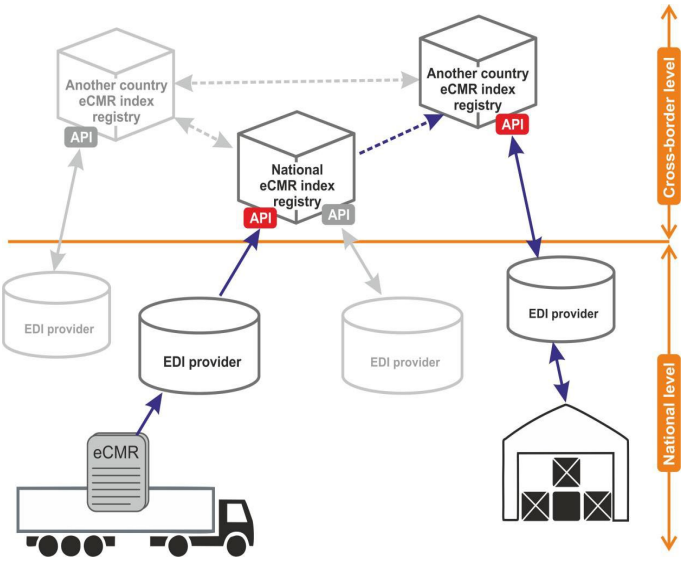
23. The DIGINNO-Proto project took place within the context of the DIGINNO (Digital Innovation Network) project by the Baltic Sea Region over the period 2017 to 2020. The e-CMR pilot project was designed and conducted over 1.5 years in 2019-2020[10] and funding consisted of € 134,000 provided by the Nordic Council of Ministers.

24. The pilot project focused on improving information exchanges between B2A, rather than B2B. It also tested information exchanges between A2A.

25. The B2B e-CMR information exchanges started by having senders issue an electronic consignment note as they handed over the goods to the carrier. For the issuing, senders used an IT service provider whose software allowed for businesses to create, access, and edit their electronic consignment notes.

26. The B2A information exchanges started with IT service providers registering the electronic consignment note in a national e-CMR index registry. The system was developed with distributed ledger technology (DLT). At border or other relevant checkpoints, authorized government authorities were granted access to the e-CMR index(es) information via application programming interface (API) accesses connecting the control authority to the e-CMR index(es).

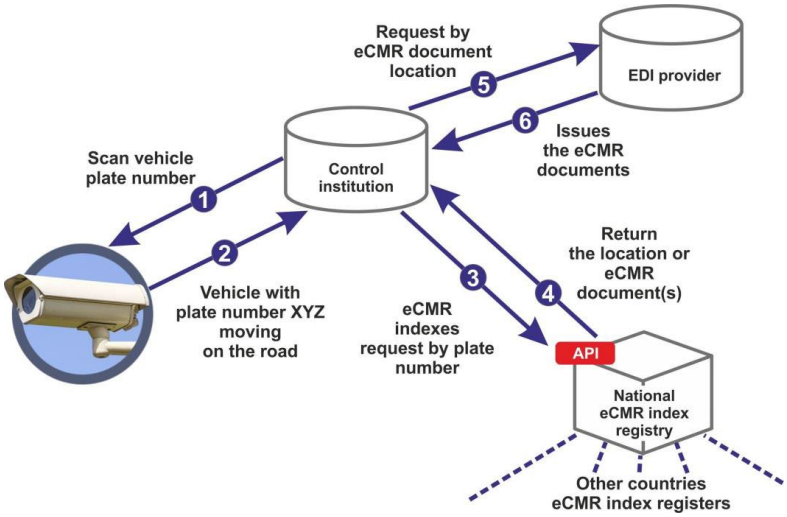
The IT service provider, or Electronic Data Interchange (EDI) provider, exchanged data with the e-CMR index registry



27. For example, in Estonia, once the transportation process started and an electronic consignment note was created, cameras were used at the Estonian border to identify the vehicle's plate number. Upon identification, the system made a request to the Estonian Tax and Customs e-service to identify the goods inside the vehicle. The control institution then requested the data from the electronic consignment note to the IT service provider through the location information available in the e-CMR index registry (see image below). The data provided the authorities with information on the goods in the vehicle and enabled them to carry out a risk analysis on whether to perform an inspection or not.

[10] "DIGINNO-Proto One-Pager - e-CMR cross-border indexing prototype," Ministry of Economic Affairs and Communications of the Republic of Estonia, and Nordic Council of Ministers, https://900ed4a8-9c07-4bbc-bdb5-97fdb5896eb2.filesusr.com/ugd/8cf6e6_96019bcc8a474507aadb87c6f8ba033b.pdf

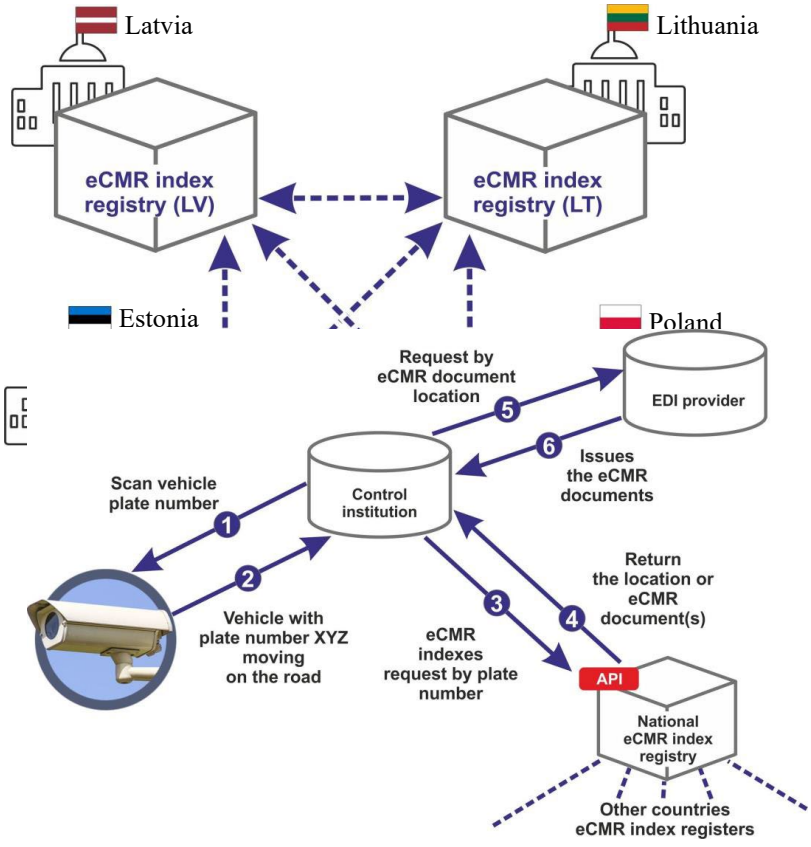
Estonian process of e-CMR index registry scheme



28. The e-CMR index registry system developed allowed for the updating of electronic consignment note indexes, registration of the viewings of the electronic consignment note indexes, registration of the time and name of the user that performed changes to an index, and the establishment of functionalities based on user rights (authorities and business had different types of access and rights relating to the electronic consignment note). The system complied with EU standards and adopted the UN/CEFACT technical standards on e-CMR. This approach involved the development of a national e-CMR registry which was interconnected with the registries of the countries involved.

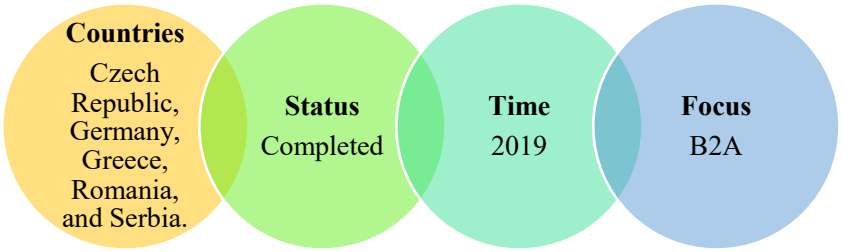
29. Regarding A2A information exchanges, the national e-CMR index registries allowed for the exchange of e-CMR index(es) information at a cross-border level. The information in the e-CMR index registries could be exchanged through the distributed ledger system.

Information is exchanged via the national index registries using DLT technology



30. Upon assessment, testing was considered successful. Questionnaire results indicated that authorities deemed the e-CMR pilot project valuable for their work. The final report of the project recommended legalizing the concepts in the prototype, promoting its expansion to other countries, scaling up e-CMR pilot projects across Europe, and increasing awareness on the need for e-CMR implementation, among other recommendations.

2. AEOLIX Living Lab 12 project – Czech Republic, Germany, Greece, Romania, and Serbia.[11]



31. In September 2016, the EU's Digital Transport and Logistics Forum (DTLF) launched Project AEOLIX to connect logistics information systems across EU member countries. The AEOLIX platform allowed for real-time exchanges of information among businesses and relevant authorities to improve sector and value chain efficiency.[12]

32. The AEOLIX project involved the creation of several Living Labs (LLs) which had different foci. In April 2019, Living Lab 12 (LL12) started, focused on implementing e-CMR across critical corridors within Europe. The pilot was set for completion in August 2019.[13] The objectives to be tested were (1) the reduction of administrative work from replacing paper consignment notes with electronic ones (2) the reduction of truck inspection time, and (3) the promotion of more environmentally friendly transport operations.

33. LL12 covered four critical corridors for carriage of goods by road operations in Europe[14] which included south-east Europe (Greece and Romania), the Balkans (Romania and Serbia), central Europe (Germany and the Czech Republic), and central Europe to the Mediterranean (Greece, Serbia, and Germany). IRU, private sector entities and national authorities of Czech Republic, Germany, Greece, Romania, and Serbia participated in the implementation of the pilot.[15]

34. A survey was carried out as part of the impact assessment of LL12. Responses indicated participating businesses found there was a reduction of waiting time for trucks in the terminal before and after AEOLIX. Other benefits included a decrease in the time taken to create electronic consignment notes, a reduction in the average time needed to complete the signature process, a drop in the average time spent on road inspections, and a decrease in the average time spent doing administrative work. Costs relating to transport document processing of losses, damages, and delays of goods were also reduced.

[11] Information from this section comes, unless otherwise stated, from "D. 6.2 - AEOLIX Living Labs Operational Impacts Assessment," AEOLIX, 15 November 2019, https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5c952d778&appId=PPGMS

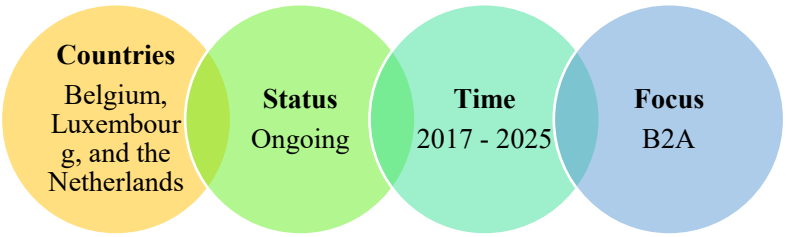
[12] "AEOLIX: Architecture for European Logistics Information Exchange – Vision Document," AEOLIX.eu, updated January 2018: 1, https://aeolix.eu/vision

[13] "AEOLIX Pilot Introduces electronic Freight Documents in Germany and Greece," Transfollow, accessed 7 October 2020, https://transfollow.org/news/aeolix-pilot-introduces-electronic-freight-documents-in-germany-and-greece; "Digital streamlining of logistics exchange," IRU.org, accessed 14 May 2021, https://www.iru.org/what-we-do/being-trusted-voice-mobility-and-logistics/iru-projects/aeolix

[14] "AEOLIX Living Lab e-CMR: Digitalization of freight transport documents," AEOLIX: 2.

[15] "Living Lab 12: e-CMR," AEOLIX.eu, accessed 14 May 2021, https://aeolix.eu/living-lab-12-e-cmr/

3. Benelux e-CMR project – Belgium, Luxembourg, and the Netherlands[16]



35. Following a Belgian e-CMR national pilot in 2016 and 2017, the Benelux countries (Belgium, Luxembourg, and the Netherlands) decided to carry out a cross-border pilot for e-CMR implementation in 2017. The Netherlands and Luxembourg are contracting states to e-CMR. Belgium has yet to ratify.

36. Decision M (2017) 12 of the Benelux Committee of Ministers[17] relied upon article 1 (5) of the CMR Convention, to which the three countries are signatories, to temporarily not apply CMR for their cross-border traffic, halting the use of paper-based consignment notes as a requirement in international transport of goods by road between their countries. The objective was to set up a regulation within the Benelux for the potential introduction of e-CMR by allowing transport carriers to only use electronic consignment notes in the transport processes. Although the use of electronic consignment notes was encouraged, paper consignment notes could also be used.

37. The project was launched on 1 December 2017 and originally planned to run for three years, finishing in 2020. However, due to its success and the Covid 19 pandemic, it was extended to eight years, and now set to end in 2025.[18]

38. The B2B e-CMR information exchanges were conducted through the services of four accredited IT service providers.19 For the electronic consignment notes to be valid commercial documents serving the function of paper consignment notes, they needed to be in conformity with articles 1 to 6 of e-CMR, issued by an IT service provider in a Benelux country using technology authorised by the relevant authorities, and used by users reported by the IT service providers to the relevant authorities. Further detailed requirements concerning the electronic consignment notes may be found in articles 3 and 5 of Decision M (2017) 12. The electronic consignment notes were also required to abide by relevant EU Regulations such as eIDAS.[20]

39. Regarding B2A information exchanges, authorities could have access to the databases of the IT service providers to check the information from an electronic consignment note.[21] IT service providers needed accreditation to participate in the pilot, and each of the Benelux countries had to designate a national competent authority to perform the accreditation process

[16] Information from this section, unless otherwise stated, comes from "Joint explanatory note regarding decision M (2017) 12 of the Benelux Committee of Ministers concerning an intra-Benelux pilot project on the electronic consignment note," submitted by the Government of the Netherlands, Working Party on Road Transport, Inland Transport Committee, Economic Commission for Europe, 16–18 October 2018, https://unece.org/DAM/trans/doc/2018/sc1/ECE-TRANS-SC1-2018-4e_01.pdf

[17] "Joint explanatory note regarding decision M (2017) 12 of the Benelux Committee of Ministers concerning an intra-Benelux pilot project on the electronic consignment note," submitted by the Government of the Netherlands, Working Party on Road Transport, Inland Transport Committee, Economic Commission for Europe, 16–18 October 2018, https://unece.org/DAM/trans/doc/2018/sc1/ECE-TRANS-SC1-2018-4e_01.pdf

[18] "Benelux pilot e-CMR extended," TLN.nl, 7 December 2020, https://www.tln.nl/nieuws/benelux-pilot-e-cmr-verlengd/

[19] "Preparatory Actions to pilot a Digital Multi-modal Transport Corridor between the Baltic Sea and the Black Sea," EU4Digital, ENI/2018/396-72, June 8, 2020: 6.

[20] Regulation (EU) No. 910/2014 of the European Parliament and the European Council on electronic identification, authentication, and trust services for electronic transactions (eIDAS) in the EU, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R0910&from=EN

[21] "State of play and barriers to the use of electronic transport documents for freight transport: Options for EU level policy interventions – Final report," European Commission, 2018: 42.

and implement Decision M (2017) 12. Accreditation was conditional on fulfilling certain requirements described on article 4 of Decision M (2017) 12.

40. Decision M (2017) 12 also stipulated data protection measures to guarantee that the use of data would be limited to the effective implementation of e-CMR so as not to circumvent prevailing legislation related to road transport data protection or personal data protection. As another safeguard, the Benelux specified that only designated authorities could use the data, data could not be used for purposes other than those of the pilot project, and data could not be shared with other authorities with the exception of reporting irregularities.

41. In relation to A2A information exchanges, the designated national authority had the role of contacting the authorities of other Benelux countries to update them on information pertinent to the pilot such as the list of providers asking for participation in the project (with their authorization status). The countries agreed to amend their legislation and regulations to implement the pilot if necessary.

42. Assessments to date indicate that the use of electronic consignment notes within the Benelux countries has increased steadily. In 2020, during the Covid 19 pandemic, the use of e-CMR rose by 50% as it facilitated reduced physical contact.[22] The pilot proved that the use of electronic consignment notes is at least as safe and reliable as CMR under the conditions specified in the pilot.[23]

43. The Benelux governments recently announced that an Access Point will be developed and integrated within the Benelux system to facilitate communication between carriers, authorities, and governments (B2A and A2A information exchanges). The Access Point is expected to be ready in 2021.[24]

E. National and binational e-CMR pilot projects

44. Some countries have participated in national and binational pilot projects. Although detailed information on these pilots is limited, some countries have shared general information on their experiences. The focus has largely been on B2B information exchanges, and it appears that the pilots were considered successful as accessions to e-CMR have followed.

1. France and Spain[25]

45. In January 2017, France and Spain launched the first e-CMR pilot worldwide. The pilot aimed to test the advantages and reliability of e-CMR implementation. The goods, consisting of oranges, were carried successfully from Huelva, Spain to Perpignan, France in an 1300km journey.

2. France, the Netherlands, and the United Kingdom of Great Britain and Northern Ireland[26]

46. In February and March of 2019, an e-CMR pilot project was conducted between France, the Netherlands, and the United Kingdom. Goods were transported from France to

[22] "Benelux pilot e-CMR extended," TLN.nl, 7 December 2020, https://www.tln.nl/nieuws/benelux-pilot-e-cmr-verlengd/

[23] "Digital consignment note for Benelux transport," NIWO.nl, 2 December 2020, https://www.niwo.nl/?pageid=121&store=nieuws_detail&ID=417

[24] "Benelux levert maatwerk met hernieuwd Besluit voor de digitale vrachtbrief," Benelux.int, 1 December 2020, https://www.benelux.int/nl/nieuws/benelux-levert-maatwerk-met-hernieuwd-besluit-voor-de-digitale-vrachtbrief

[25] Information from this section, unless otherwise stated, comes from "First ever border crossing to use e-CMR electronic consignment note," IRU.org, 19 January 2017, https://www.iru.org/resources/newsroom/first-ever-border-crossing-use-e-cmr-electronic-consignment-note

[26] Information from this section, unless otherwise stated, come from Agnieszka Kulikowska – Wielgus, "The United Kingdom has introduced an electronic bill of lading. It is to facilitate transport around

England; the route involved road carriage from France to the Netherlands, and ferry transportation of the vehicle to the UK. After the pilot project, in December 2019, the Government of the UK ratified e-CMR.

3. Slovenia

47. Slovenia acceded to e-CMR in August 2017 and has reached out to other countries that have been implementing pilot projects to express their interest in participating.

48. Slovenia's first pilot project was in March 2019. Goods were carried by road from Zagreb, Croatia to Novo Mesto, Slovenia. Though Croatian authorities were not involved in the pilot, Slovenian authorities tested the use of an electronic consignment note for the entire journey. It should be noted that paper consignment notes were used on Croatian territory and electronic consignment notes were used on Slovenian territory.

49. The B2B information exchanges started by having the sender create an electronic consignment note in a designated IT service provider upon collection of the goods by the carrier. The original electronic consignment note and any changes required new signatures from all of the parties that had signed the document until that point (for authentication purposes). After receiving the goods, the consignee was required to confirm receipt and sign the electronic consignment note to confirm completion of the transaction.

50. The authentication process included the on-glass signature method, which was outsourced to another IT solution provider. The service captured the signatures of the sender, carrier, and consignee (or their agents) during the carriage of the goods in an iterative process, as well as when any amendments were added to the electronic consignment note. In such a case, all the signatures obtained until that point had to be reobtained. Upon the consignee's signature, the content of the electronic consignment note was saved in a PDF file in a secure cloud storage and could not be altered any further.

51. In terms of B2A information exchanges, authorities had temporary access to the electronic document through a QR code which the carrier showed at border and/or control checkpoints. Access to the full details of the consignment note was via the IT service provider's platform.

52. The pilot posed no significant direct financial costs for the government. The software service was offered without cost for the businesses involved in the pilot. Drivers were trained to use the IT solution application and were taught how to engage with authorities when producing an electronic consignment note as opposed to a paper consignment note.

53. The assessment from the participating businesses was positive. Consulted parties expressed their eagerness for extended implementation of e-CMR as soon as possible, especially with neighbouring countries who are also contracting states.

54. Slovenia is currently in the process of establishing a working group comprised of authorities and industry to set up the steps for future pilot projects and extended implementation of e-CMR.

4. Slovenia and Turkey

55. In November 2019 and January 2020, Slovenia and Turkey carried out two e-CMR pilots for the carriage of goods by road. The pilot had a B2B and B2A information exchange focus, and it required A2A coordination.

56. The goods went from Maribor, Slovenia to Istanbul, Turkey successfully. The customs officers verified e-CMR by reading the QR code on the carrier's mobile device through the camera on their phone. In one transportation, e-CMR access to the electronic consignment note at a border crossing was granted to the Slovenian authorities, and in the other the access was granted to the Turkish authorities.

Brexit," TRANS.info, 14 January 2020, https://trans.info/de/the-united-kingdom-has-introduced-an-electronic-bill-of-lading-it-is-to-facilitate-transport-around-brexit-170444

57. Feedback from the pilot project included that the operational process was accelerated by the implementation of the electronic consignment note, information was immediately accessible, and the tracking possibilities for the goods were upgraded. Also, errors were reduced when completing the consignment notes, and parties involved in the project emphasised that digitalisation expanded the possibility of integrating e-CMR systems with other digital transport documents. The Turkish Union of Chambers and Commodity Exchanges and the Ministry of Transportation and Infrastructure have expressed they are carrying out studies on the implementation of e-CMR and the use of electronic consignment notes.

IV. Lessons learned

A. Changing from paper-based to electronic consignment notes reduces administrative costs, saves time, and gives rise to business efficiencies, amongst other benefits.

58. Assessments and feedback from e-CMR pilot projects have generally highlighted and identified the economic, social, and environmental benefits for businesses and authorities from the digitalisation of paper consignment notes being mentioned in part 2 of this document. Businesses and countries have seen time savings, reductions in administrative costs, increased efficiency, reduced congestion at border crossings and a simplification of the process of carriage of goods by road through testing the implementation of e-CMR. e-CMR could improve cross-border connectivity if other documents (customs, phytosanitary, business) used in transport are also digitalized. Moreover, e-CMR pilots have suggested that stakeholders see health and safety benefits in the use of electronic consignment notes in the context of the Covid 19 pandemic emergency.

B. Pilot projects have been performed towards the operationalization of e-CMR.

59. e-CMR protocol lists the mandatory and optional (if relevant) particulars to be found in an electronic consignment note as well as what needs to be covered in the agreement required between the private parties for an electronic consignment note to be valid.

60. These requirements are based on the legal concepts mentioned in the explanatory memorandum to e-CMR. The objective being that “in legally contractual relations the best conditions for the protection and security of documents are offered to operators”. Importantly, three conditions are required:

(a) the inalterability of the message without the agreement of the parties, but also the possibility to change if there is agreement;

(b) understanding and acceptance of the message by the consignee; and

(c) identification of the parties and security of the authentication of their signatures.

61. These conditions are reflected in articles 3 (authentication of the electronic consignment note), 4 (conditions for the establishment of the electronic consignment note) of e-CMR, and 5 (procedures for its operation and on the implementation of these procedures), though articles 1 through to 6 should be read as a whole and applied as the key provisions of e-CMR.

62. While e-CMR is clear on the legal concepts underpinning the various technical aspects mentioned in articles 3 to 6, it is silent in terms of the mode/s or method/s to fulfil the specific requirements of e-CMR in relation to the production and authentication of the electronic consignment note, its accessibility, and how to achieve the effects of terms used in the CMR convention such as “handing over”, “delivering” and “copy/copies” by way of some examples.

63. Accordingly, in the pilot projects, contracting states and the private parties which were involved have chosen different formats, electronic signatures, means of alteration, methods of information exchange and confirmation, processes to amend the electronic consignment note, the fallback procedure and other technical modes or methods from the wide range of IT solutions available. Also, several databases were created to store all this data while trust to the system by all stakeholders will be warranted if integrity of data is ensured. The pilot projects have also adopted different approaches towards managing the information exchanges. However, the pilot projects were very useful because:

- They accelerated or reflated countries interest to ratify or accede to e-CMR protocol and to participate in the different pilots. During the period 2017-2020 there were almost double ratifications comparing to the period 2008-2017;
- Different good practices were used, promoted or proposed further assisting the discussions on which business and technological approaches to be used in order to ensure that the interests of all stakeholders that are directly or indirectly using the CMR, either from national authorities or the private sector are ensured and warranted; and
- They brought to the surface challenges concerning the potential implementation of article 5 of the e-CMR protocol such as the authentication mechanisms, the integrity of the data and the inalterability of the messages, the processes to be followed in order to amend the electronic consignment note, security and storage of data, access to the data, fallback procedures in case of technological failures amongst others. That the pilots adopted different business and technological approaches reflects that the stakeholders involved in the different pilot projects to date have not discussed nor considered the possibility of coordinating their approach with others.

C. e-CMR has the scope to be part of a multimodal electronic transport document in the ultimate future

64. In a number of countries, the use of pilot projects towards e-CMR implementation has been a component of larger projects regarding the digitalisation of documents for the carriage of goods (i.e. AEOLIX). Various single-window initiatives are being pursued across countries which seek to facilitate multimodal transport activity and documentation, increase the efficiency of the transport and logistics sectors, and improve transparency.

V. Conclusions

65. This paper summarizes the input provided by the countries participated in the informal group of experts on key pilot projects towards e-CMR operationalization and lessons learned as well as conclusions drawn by academics and practitioners suggested by the experts of the group on general benefits and costs generated by adopting electronic consignment notes without considering though different operational scenarios or factors including different technological approaches.

66. Taking the good practices from the pilot projects and learnings into account, the informal group of experts makes the following recommendations with the ultimate goal the agreement by all stakeholders on the operations of e-CMR in the future in mind:

(a) CMR contracting states who have not yet done so are encouraged to accede to or ratify e-CMR;

(b) e-CMR contracting states and CMR contracting states interested in becoming a party to e-CMR continue to use SC.1 as the platform for the exchange of information and development of best practices on e-CMR implementation;

(c) Pilot projects should continue and the performance of new ones should be encouraged because they are very useful to try out possible designs of e-CMR compliant system(s) with a view to achieving the optimal operations of e-CMR system(s) in the future; and

(d) The SC.1 secretariat may wish to consider appropriate future actions based on the content of this paper.